

CBCS SCHEME

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17MT43

Fourth Semester B.E. Degree Examination, June/July 2023

Microcontroller

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Differentiate between RISC and CISC architecture. (06 Marks)
- b. Differentiate between Harvard and Von-Neumann architecture. (06 Marks)
- c. Explain the salient feature of 8051 microcontroller. (08 Marks)

OR

- 2 a. Explain the internal memory organization of 8051 with neat diagram. (10 Marks)
- b. Explain following pins of 8051 microcontroller
(i) ALE (ii) PSEN (iii) EA (iv) RST (10 Marks)

Module-2

- 3 a. Define addressing modes. Explain different addressing modes with suitable example. (10 Marks)
- b. Explain the operation performed by the following instructions.
i) DA A (ii) MUL AB (iii) CJNE (iv) SETB C (10 Marks)

OR

- 4 a. Assume the P1 is an input port connected to a temperature sensor. Write a program to read the temperature and test it for the value 75. According to the test results place the temperature value into the register indicated by the following : If $T = 75$, then $A = 75$ if $T < 75$ then $R1 = T$, if $T > 75$ then $R2 = T$. (10 Marks)
- b. Assuming that ROM space starting at 250H contains "India" write a program to transfer the bytes in to RAM locations starting at 40H. (10 Marks)

Module-3

- 5 a. What are data types? Explain the different C data types for 8051 with their data size and data range. (10 Marks)
- b. Explain format of TMOD and TCON registers. (10 Marks)

OR

- 6 a. Define time delay? What are the ways to create time delay? Discuss factors affecting accuracy of time delay. (10 Marks)
- b. Explain Mode 1 programming and Mod 2 programming with diagrams. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-4

- 7 a. List and explain the different Land shaking signals of RS232. (06 Marks)
b. Write an assembly program to transfer a letter 'Y', 'E', 'S' serially at 9600 band continuously. (08 Marks)
c. Write a C program for the 8051 to transfer the letter "A" serially at 4800 band rate continuously. Use 8 bit data and 1 stop bit. (06 Marks)

OR

- 8 a. Explain different interrupts of 8051 with the help of interrupt vector table. (08 Marks)
b. Show instructions to
i) Enable the serial interrupt Timer 0 interrupt and external hardware interrupt
ii) Disable the time 0 interrupt
iii) Show how to disable all the interrupt with a single instruction. (06 Marks)
c. Write 8051 C programs to receive bytes of data serially and put them into P1. Set the band rate at 4800, 8 bit data and 1 stop bit. (06 Marks)

Module-5

- 9 a. Explain the keyboard interfacing with neat circuit and flowchart. (10 Marks)
b. Write a program to rotate the stepper motor continuously
i) Clockwise using the wave drive of 4 step sequence.
ii) Clockwise using half step 8 step sequence. (10 Marks)

OR

- 10 a. Write an 8051 C program to send letters 'A', 'B' and 'C' to the LCD using delays with neat sketch for interfacing. (12 Marks)
b. Write an Assembly code to generate sine wave using DAC interfacing with 8051 with full scale voltage of 10V. (08 Marks)
